The shape of the bases of turbiditic sandstone beds versus the underlying fine-grained sediments' features and their foraminifer content: an example from the Magura Beds in Ropica Górna area

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The research regarded sediments from the Magura Nappe in the Polish Outer Carpathians deposited during the Eocene-Oligocene transition. It investigated the relation between the shape of the base of turbiditic sandstone beds and the features of underlaying fine-grained sediments, in particular their foraminifer content and distribution. The carbonate, sand fraction and quartz grains content in mudstones were other analysed features. An important aspect of the research was to examine the vertical changes in these features, as well as to observe the relation between these changes and the type of the overlying sandstone bed bottom.

Two types of bed bases have been distinguished; flat and irregular, and three classes of bed thicknesses have been established; thin (<10 cm), medium (10-30 cm) and thick (>30 cm). Considering the above criteria 10 cases of sandstone and underlaying mudstone have been chosen from which the total number of 26 samples of fine grained deposit was taken. Each case has been analysed by taking 2-3 samples directly from under the sandstone base in various distances. One case was considered for both flat and irregular medium thickness sandstone beds, while two examples have been investigated for thin and thick bedded sandstones with different base types. In order to examine the mudstone sand fraction components the samples have been disintegrated by liquid nitrogen method and the carbonate content has been obtained using Eijkelkamp calcimeter (08.35).

All data have been presented in the chart with sample order corresponding to the outcrop setting; therefore the changes in the analysed features were clearly visible. The large number of foraminifer has been observed both in turbiditic and non-turbiditic shale. The general trend of decreasing carbonate content towards the mudstone top with concurrent increase of foraminifer content was clearly noticeable. The greater amount of a was most of the time related to higher amounts of agglutinated foraminifer instead of calcareous benthic and planktic foraminifer. The analysis of sand fraction content in shale showed in four cases increasing trend towards the mudstone top and in two cases decreasing pattern and no trend was observed for the remaining cases. Similarly for five cases the increase of quartz grains content towards the mudstone top was detected. Moreover glauconite occurrence was more common in samples taken from the top parts of fine-grained sediments overlain by thick sandstone beds. No relation between the shale carbonate content, as well as its foraminifer amount and the type of the sandstone bed base was observed.

Four samples representing interturbidite have been identified. Three of them were taken below sandstones with flat bed base and one came from the sediment underlying sandstone bed with irregular base. It may indicate that the turbidity currents resulting in flat bed bottoms have smaller erosional potential. It is worth mentioning that interturbidite appearance was related to thin and medium bed sandstones, which, together with other features of fine-grained sediments especially their foraminifer distribution, suggest a stronger rate of erosion by sedimentation of sandstone beds with larger thickness.

Remin, Z., Dubicka, Z., Kozłowska, A., Kuchta, B. (2012): Marine Micropaleont, 86-87: 11–14.